

# Chapter 2. Operating Your Heating Oil Tank

If you own or operate an underground oil tank used to heat a building, you must perform certain routine duties. This chapter describes these duties.

Operating and maintaining your UST system is an important part of your long term business plan to protect your investments while protecting the environment.

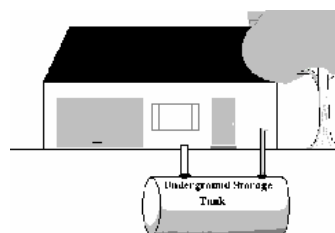
If your tank is also hooked up to an emergency power generator, then it is considered a motor fuel tank system. See the companion document "Plan Talk on Motor Fuel Tanks" for more information.

## Terms to know in this chapter

- ☐ Leak detection
- ☐ Spill prevention
- ☐ Corrosion protection

## How old is your tank?

The rules for heating oil tanks are generally the same for any age tank, but older heating oil tanks have some extra options, which will be explained in this chapter.



All heating oil tanks installed after September 16, 1991, must be double-walled and have double-wall piping.

**Note: Only licensed oil burner technicians may connect a heating oil tank to a furnace or boiler.**

Figure out which sections apply to your tank system, then read about your:



# Detecting leaks

One of the most important things you can do is to periodically ensure that your UST tank and piping are not leaking. In this section we will cover options, actions, and records.



## Terms to know in this section

- ☐ Groundwater monitoring
- ☐ Interstitial monitoring
- ☐ Product line
- ☐ Return line



Your leak detection options depend on how old the tank is.



**For newer tanks** installed after September 16, 1991, double wall tanks and piping with continuous interstitial space monitoring are the only allowable method of leak detection.



**For older tanks** installed before September 16, 1991, you can either have double wall tank and piping or use ground water monitoring.

**Double Wall Tank** means you have a tank with an inner and outer wall plus some way to check for leaks between those two walls. To be more specific, you must continuously check the interstitial space, the gap between the inner and outer wall of the tank, and ensure there is no petroleum or water in that space.



Upright tube in center is where the interstitial sensor is located.

Double Wall Piping means you have a pipe within a pipe plus a way to check the space in between the walls.



**Notice the large bucket on top of the tank.** That's called a sump, which contains the portion of the double wall piping that enters and leaves the tank. There should also be a sensor in the sump. The sensor should be wired into the same console used to show leak detection for the tank as well.



**Looking in the bucket, you can see the piping.** The sensor, circled, must be functioning and be able to detect unwanted liquid in the sump, then alert the owner.

## What does a double-wall monitor look like?

Your tank system should have an electronic sensor that is connected to a console or computer box. The sensor should be set to check the interstitial space on a continuous basis.



Fred maintains a heating oil tank at a hospital. Part of the underground piping is inside a plastic PVC pipe which acts as a shield between the piping and the soil. The plastic pipe does not cover every bit of the buried piping and is therefore not legal. At his next annual inspection his UST system fails. Why? Because Fred doesn't have a true interstitial space to contain the oil if the copper pipe failed.

Groundwater monitoring means you have a number of small diameter wells surrounding the underground tank and piping. The wells allow you easy access to the groundwater so you can sample the water to ensure there is no oil in there.

This option is only for older tank installed before September 16, 1991. Also, the ground water must be shallow enough.

Groundwater monitoring is only allowed for older, single wall tank and piping systems.



Now that you know you have leak detection equipment, what do you do next? Check for leaks! State law says there are certain things you must do to keep an ever-vigilant eye for potential problems.

## Double wall tanks and pipes



### **Checklist: Doing Leak Detection Right**

- ☐ Check the interstitial space of the tank.
- ☐ Check the interstitial space of the pipe.
- ☐ Understand exactly what you are measuring and what the results mean.
- ☐ Make sure you keep records of your results.
- ☐ Treat a suspected release as a serious problem.

You must ensure that the tank and piping are tight and free of liquid oil or water. The presence of oil in that space means the inner wall of the tank may have a leak. The presence of water in the space may mean the outer wall of the tank has a hole and ground water is getting in. Under either scenario, it means you have a problem.

**Tanks:** Checking the double wall tank means checking the console that is wired to a sensor in the interstitial space. Your console will either be a standalone or combination device. Once a year during inspection the console and the sensor must be tested to make sure they are functioning properly.



**Always look and listen for alarms. Report all known or suspected leaks immediately.**

**Interstitial monitoring means always watching for leaks.**

**Check the system every 30 days for proper operation by testing the alarm button.**

**Piping:** Checking the double-wall piping means checking the console that is plumbed to a sensor in the lowest point of the piping system, called the sump. Your console will either be a standalone or combination console. Once a year the console and sensor must be tested to ensure it is working properly.



**Always look and listen for alarms. Report all known or suspected leaks immediately.**

**Interstitial monitoring means always watching for leaks.**

**Check the system every 30 days for proper operation by testing the alarm button.**



### **Problems with double wall piping**

If anything goes wrong with interstitial monitoring, chances are it will occur in the piping sump. Here are common problems found in sumps and what you can do about it. Have your UST service provider fix these.

- ☐ Water or oil accumulates in bottom
- ☐ Sump sensor raised too high to detect release
- ☐ Piping boots loose, damaged or cracked
- ☐ Holes in side of sump wall or sump bottom

## The Trouble with Double (wall piping)

Tank systems installed after September 16, 1991 must have double-wall piping. But is it truly double walled? If the outer wall piping is not totally and completely enclosed, a leak could still occur without you knowing it. How do I know if I have contained or just shielded piping?

### True double-wall piping

- ☐ Ends of outer wall of piping have no gaps, holes or openings to the soil
- ☐ Required to provide containment and protect copper piping.
- ☐ Required after Sept 16, 1991.

### “Shielded” piping

- ☐ Copper piping inside plastic sleeve but ends may be open to soil.
- ☐ Required to protect copper piping from damage



### Success Story

Anne has an office calendar hanging on the wall next to her computer. She has made a note to check the interstitial space the last business day of each month. She consistently finds no product there. She clips a copy of the results to a clip board which hangs next to the calendar. The Maine DEP inspector is impressed.

## Groundwater monitoring



### Checklist: Doing Leak Detection Right

- ☐ Make sure the well caps are accessible but secured (locked).
- ☐ Make sure you have a clean bailer to check the well.
- ☐ Check for floating oil or the smell of oil once a week.
- ☐ Make sure you keep records of your results.
- ☐ If you see or smell something that looks like oil, contact DEP immediately.



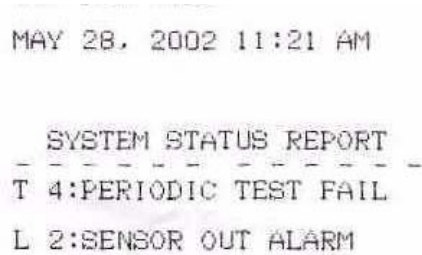
**Check your monitoring wells every week.  
If you see or smell evidence of oil in a  
groundwater well, contact DEP  
immediately.**





The double wall tank and the piping must be tested continuously for leaks. But wait, there's more. You must prove you are actually doing it. Simply telling a DEP inspector that you do it without any hard copy proof is not enough.

## Double Wall Tanks and Piping Two way keeping records

An electronic printout of a system status report. The text is as follows:

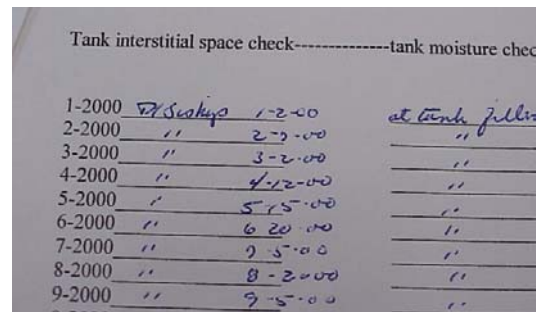
MAY 28, 2002 11:21 AM

SYSTEM STATUS REPORT

T 4:PERIODIC TEST FAIL

L 2:SENSOR OUT ALARM

**Electronic Printout**

A manual printout showing a table for tank interstitial space and moisture checks. The table has three columns: a date column, a 'Tank interstitial space check' column, and a 'tank moisture check' column. The first row is dated 1-2-00 and has handwritten notes 'PT Sealsys' and 'at tank filling'. Subsequent rows are dated 2-2-00, 3-2-00, 4-12-00, 5-15-00, 6-20-00, 7-5-00, 8-2-00, and 9-5-00. The 'Tank interstitial space check' column contains handwritten '11' for most entries. The 'tank moisture check' column contains handwritten '11' for most entries.

|        | Tank interstitial space check | tank moisture check |
|--------|-------------------------------|---------------------|
| 1-2000 | PT Sealsys 1-2-00             | at tank filling     |
| 2-2000 | 11 2-2-00                     | 11                  |
| 3-2000 | 11 3-2-00                     | 11                  |
| 4-2000 | 11 4-12-00                    | 11                  |
| 5-2000 | 11 5-15-00                    | 11                  |
| 6-2000 | 11 6-20-00                    | 11                  |
| 7-2000 | 11 7-5-00                     | 11                  |
| 8-2000 | 11 8-2-00                     | 11                  |
| 9-2000 | 11 9-5-00                     | 11                  |

**Manual Print Out**

## Groundwater Monitoring

You must have poof that you check the groundwater wells every week. Most operators use a hand written log to satisfy this rule.

If you use groundwater monitoring as your sole source of leak detection, you must check the wells every week and keep a log of the results.

## Preventing overfills

NOTE: This section only applies to underground heating oil tanks larger than 1,100 gallons.

Another important part of your responsibility as an owner or operator of a UST system is to ensure there are no overflows of fuel during a delivery. In this section, you will learn about options, actions, and records for your UST system.



Cleaning up an overfill during delivery can be expensive

### **Terms to know in this section**

- ☐ Ball float valve
- ☐ Overfill alarm
- ☐ Pressurized delivery
- ☐ Spill bucket
- ☐ Vent whistle



**In the event of an overfill  
call**

**800/482-0777**

The sooner you call,  
the lower your cleanup costs



**Spills to the ground surface can happen during fuel delivery to your tank, or during vehicle fueling. You must cleanup discharges immediately and document your actions.**



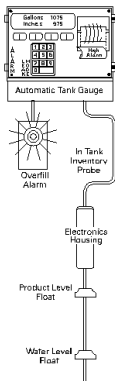




There are two types of equipment you must have in order to avoid overfills. This equipment is designed to reduce the change of spillage during fuel deliveries.



Make sure you have the right equipment

| Spill Containment  | Overfill Device<br>(2 options: pick one)   |   |
|--|--|---|
| <p data-bbox="380 737 644 835"><b>Spill Bucket</b><br/>Must hold at least 3 gallons</p>  <p data-bbox="347 1129 623 1163">[ ] Yes I have one</p> | <p data-bbox="730 737 1011 835"><b>Vent Whistle</b><br/>set to restrict flow at 95% full</p>  <p data-bbox="708 1129 984 1163">[ ] Yes I have one</p> | <p data-bbox="1070 737 1372 800"><b>Alarm</b><br/>set to alert at 90% full</p>  <p data-bbox="1086 1251 1362 1285">[ ] Yes I have one</p> |

### WARNING ABOUT BALL FLOAT VALVES

If your tank has a ball float valve or receives deliveries under pressure, beware! The ball float valve may actually cause a spill. Check with your oil distributor and make sure you don't have this situation.



Your job is pretty straightforward: Prevent overflows during oil delivery.



## Preventing overfills

- ☐ Make sure the fuel level in the tank is measured BEFORE each delivery.
- ☐ Keep your spill buckets clean and dry.
- ☐ Monitor all fuel deliveries.
- ☐ Respond to ALL overfill alarms.



## What does monitoring deliveries involve?

State law says that the UST owner, operator or oil transporter must be physically present during each delivery. Being inside sipping coffee does not count. This designated person must monitor all product deliveries.



Make sure you designate a person for this responsibility. They must be able to:

- ☐ Figure how much empty space is in the tank before the fuel is added.
- ☐ Be standing at the oil delivery point and watch for problems.
- ☐ Understand what to look for that might indicate a possible overfill event.
- ☐ Know what to do if you see or hear an alarm.
- ☐ Know what to do in the event of a spill.
- ☐ Know who to call for help.

If you have an overfill alarm, that alarm must be tested annually to make sure it works, and those who need to can hear or see it.



All spill containment and overfill prevention equipment must be tested each year to make sure the devices are working properly.



## Problems with overfill devices

### **Vent Whistles**

- ☐ May not hear it stop whistling.

### **Alarms**

- ☐ If an overfill high level alarm goes off too many times, an operator may start ignoring it.
- ☐ Alarm disconnected.
- ☐ No one knows what to do when they hear alarm.

## Spill Bucket "Musts"



The spill containment bucket:

- ☐ must be kept free of water and debris
- ☐ must be cleaned of oil after each delivery
- ☐ must be able to hold at least 3 gallons of liquid.



## Problems with spill buckets

- ☐ Cracks in lid allowing in water.
- ☐ Letting water (or oil) accumulate in the bottom.
- ☐ Cracks or holes in the side or walls of spill bucket.
- ☐ Drain plug malfunctioning or broken.



Record keeping for spill and overfill requirements simply means keeping a record of any overfills. Keep them in a log and available for inspection.

### **Example of Oil Spill Log**

| <b>Date discharge discovered</b> | <b>Source of discharge</b>            | <b>Location of discharge at facility</b> | <b>Date of cleanup</b> | <b>Method of cleanup</b> | <b>Signature of owner manager</b> |
|----------------------------------|---------------------------------------|--|------------------------|--------------------------|-----------------------------------|
| 12/5/02<br>3:30 PM               | Overflow at fill pipe during delivery | Fill pipe                                | 12/5/02                | used sorbent pads        | Bob Jones                         |
|                                  |                                       |  |                        |                          |                                   |
|                                  |                                       |  |                        |                          |                                   |

----- ✂ -----  
--

(PHOTOCOPY THIS PAGE AND KEEP EXTRAS ON-SITE)



State of Maine  
**Oil Spill  
Log**

For spills less than 10 gallons,  
you do not need to report the  
incident to DEP if you fill out this  
log.

| Date<br>discharge<br>discovered | Source of<br>discharge | Location of<br>discharge at<br>facility | Date of<br>cleanup | Method<br>of<br>cleanup | Signature<br>of owner/<br>manager |
|---------------------------------|------------------------|---|--------------------|-------------------------|-----------------------------------|
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |
|                                 |                        |   |                    |                         |                                   |

KEEP THIS LOG AVAILABLE FOR INSPECTION.

# Reducing Corrosion

Corrosion of underground steel is a serious problem in Maine. Without maintaining certain types of equipment, your tank and piping can rust out, causing a leak. In this section, you will learn about options, actions, and records for your UST system.



## **Terms to know in this section**

- ☐ Cathodic protection
- ☐ Cathodic protection tester
- ☐ Corrosion
- ☐ Impressed current
- ☐ Rectifier

## Cathodic Protection

### What exactly is corrosion?

Your buried steel tank has electrical energy inside the metal. This energy was added at the steel plant when raw iron ore was bombarded with high temperature heat, converted ore into steel. Once buried, the pent-up energy in the steel will try to escape if allowed. When the energy does escape, it's called corrosion.

If the outer surface of an unprotected steel tank was damaged by a backhoe during installation, a pinpoint spot would form, allowing energy to drain out of the metal. That's how rust starts.



Modern day steel tanks come equipped with special corrosion control devices in place to stop corrosion, but this equipment must be tested to make sure it still works.

## UST Options



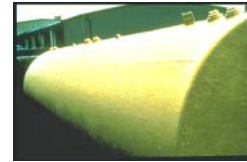
You have a few options for protecting your underground tank from corrosion. Which do you have?

### Tanks options

☐ Fiberglass tank



☐ Fiberglass clad steel tank



☐ Steel tank with factory cathodic protection (STIp3)



### Piping

☐ Copper pipe inside non-metal sleeve



☐ Non-metal and/or cathodically protected vent pipe



## UST Actions

The main thing you need to do as an operator is to ensure that your tank is protected from corrosion.



### Corrosion Protection Checklist

- ☐ **For steel tanks-** Have a corrosion test done once a year.
- ☐ **For non-metal tanks-** Keep records to prove your tank is made of something other than steel. There is no test requirement.
- ☐ **For piping, including the vent line-** Keep records to prove your tank is made of something other than steel. There is no test requirement.



A corrosion test must be done once a year by a  
Maine Certified corrosion tester.



### What is a passing grade?

If you have a steel tank, you must prove the tank is putting out enough electrical current to overcome the metal's naturally occurring desire to rust.

A corrosion test is a measurement of this electricity of the tank.

If the tank puts out an adequate level of electricity, corrosion is not occurring. Otherwise, your tank is probably rusting.

An adequate level of current is about 8/10 of a volt, or 0.850 volts to be precise.



### Pass or Fail?

|                |             |
|----------------|-------------|
| <b>-1.100v</b> | <b>Pass</b> |
| <b>-1.000v</b> | <b>Pass</b> |
| <b>-0.900v</b> | <b>Pass</b> |
| <b>-0.850v</b> | <b>Pass</b> |
| <b>-0.800</b>  | <b>Fail</b> |
| <b>-0.700v</b> | <b>Fail</b> |
| <b>-0.600v</b> | <b>Fail</b> |
| <b>-0.500v</b> | <b>Fail</b> |



Corrosion protection record must be kept where an inspector can review them. You must keep:

- ☐ **Most common:** A copy of the most recent cathodic protection test.
- ☐ **Less common:** A copy of the impressed current readings from your rectifier.



### **Is your tank older than 15 years?**

Many steel tanks of this age have been replaced as a result of corrosion. Contact a CTI or a Corrosion expert to investigate failing corrosion protection. Remember: corrosion protection only prevents corrosion if it is maintained. If the voltage readings are consistently failing (less than -0.850 volts), the tank is not adequately protected from corrosion, nor will it pass the annual inspection. If it cannot be fixed the tank must be removed.

